tion (ossification) of the branches of the cœliac axis and the mesenteric artery. Two of the five dogs experimented upon died of these perforating ulcers; a third of them manifested the signs of gastro-intestinal catarrh. The incrustation of the arteries was discovered likewise in two out of the five dogs, and has not been looked for in the remaining three. These pathological alterations, which had been formed without obvious symptoms during life, must make us careful in asserting that the bile may be drawn off without material injury to the constitution; the more so, as all the dogs experimented upon, as well by the authors as also by Schwann,[1] Nasse, and Arnold, died more or less suddenly, although they had been well provided with food. Regarding the etiology of the incrustation of the arteries, we must wait for further observations; we have already other pathological facts before us which make it probable that diseased states of the bile-conducting apparatus are apt to cause this morbid condition of the bloodvessels of the intestines.—*B. & F. Med.-Chirurg. Rev.*, Jan., 1857, from *Verhandl. d. Wurzb. Gesellsch.*, vi. 3, 1856.

5. *Membrana Pupillaris.*—Dr. Webb exhibited to the Norwich Pathological Society the following specimens:—

1. An injected specimen from human fœtus of five months, of a posterior view of the entire membrana pupillaris, *in situ*, with the lens removed.

2. A vertical section of the corresponding eye, showing the looped vessels of the membrana pupillaris passing to it over the anterior margin of iris.

3. Detached capsule of the lens, with vessels spreading from pole to pole of the lens, in connection with another preparation of the same eye, verifying the commonly received opinion of the existence of this membrane as a distinct structure closing the pupillary aperture.

These preparations were presented in consequence of Professor Quekett having unsettled the question as to the true character of this part, and to negative the assertion advanced in his *Histological Lectures* (vol. i. page 131), "that at one stage of development of the lens, the whole capsule is covered with vessels; and if it should so happen, in the course of the dissection, that the anterior layer be detached from the posterior, the anterior layer would be described as the membrana pupillaris; but if the lens come away entirely covered with vessels, no such membrane is found."—*British Medical Journal*, Feb. 21, 1857.

MATERIA MEDICA AND PHARMACY.

6. *On the Vapour of Amylene.*—Dr. Snow read before the Medical Society of London (Jan. 10, 1857), a paper on this subject.

He said that amylene was first discovered and described, in 1844, by M. Balard, Professor of Chemistry at the Faculty of Science of Paris. It was made by distilling fusel oil with chloride of zinc. M. Auguste Cahours had given the name of amylene five years previously to a product which was isomeric with it, and was made nearly in the same manner, but was now termed paramylene. Amylene itself was a colourless and very mobile liquid of extremely low specific gravity. M. Ballard had not stated the specific gravity; but he (Dr. Snow) had found it to be 0.659 at 56°. It was very volatile, boiling at 102° Fahr., and the specific gravity of its vapour was 2.45. It was a compound of ten atoms carbon and ten hydrogen, and it bore the same relation to fusel oil, or amylic alcohol, that olefiant gas, or ethylene, bore to common alcohol. It burnt with a brilliant white flame. It was soluble in alcohol and ether in all proportions, but was very sparingly soluble in water. As far as he could ascertain, it required rather more than 10,000 parts of water for its solution. It had an odour somewhat resembling naphtha; some persons thought the odour agreeable, and some thought it unpleasant; the odour was not so strong or permanent as that of sulphuric ether, and it

[1] Müller's Archiv. 1844.

did not remain long in the patient's breath. The vapour of amylene was much less pungent than those of ether and chloroform, and, therefore, it was much easier to breathe, and had not caused coughing, except a little in two patients with catarrh. He was not aware of the existence of amylene till a few months ago, or he would have tried it sooner; for, judging from experiments which he had made on analogous substances, there could be no doubt of its causing insensibility when inhaled; but he could not tell, without trial, whether it might not be too powerful, otherwise objectionable, in its action. He made several experiments on small animals with amylene, and after inhaling small quantities of it himself, he administered it in King's College Hospital, commencing with cases of tooth-drawing, on Nov. 10, 1856, and he had more recently given it in the larger surgical operations. He found, from experiments on animals, that to induce a very complete state of coma, which he called the fourth degree of narcotism, it required that a fifth part as much amylene should be absorbed as the blood was capable of dissolving. To cause the second degree, or that state in which consciousness and volition were disordered, but not abolished, it required a tenth part as much as the blood would dissolve; whilst to induce the third degree of narcotism, which was as far as he had found it necessary to carry the effect in the human subject, it required an intermediate quantity, or about fifteen per cent. In the case of chloroform, ether, and several allied substances, the proportion which required to be absorbed was far less, being only, for the fourth degree of narcotism, about one-twenty-eighth part as much as the blood was capable of dissolving. Benzin, which was a simple carbohydrogen, like amylene, was intermediate between this and the above substance in the relative amount of it which was absorbed, one-seventeenth part as much as the blood would dissolve being required to induce the fourth degree of narcotism. Whilst the relative amount of amylene absorbed was high, the actual amount was extremely small, owing to its very sparing solubility in the serum of the blood and other watery fluids. He calculated that in the adult human subject the amount of amylene circulating in the system, in the third degree of narcotism, was less than three minims. Viewed in the light of the small quantity which required to be absorbed to cause insensibility, amylene was a very powerful agent: but when considered in relation to the quantity which was consumed during inhalation, in the usual way, it was very far from being powerful. This arose from the great tension and the small solubility of the vapour, in consequence of which it was, with the exception of a small fraction, expelled from the lungs again without being absorbed. It took from three to four drachms of amylene to cause insensibility in the adult, whilst less than a drachm of chloroform was usually sufficient. The quantity of sulphuric ether required to cause insensibility in the adult was eight to ten fluidrachms, one-half of which was absorbed into the blood. In a protracted operation, the quantity of amylene used was greater than that of sulphuric ether, as the small quantity of the former which was absorbed was quickly exhaled again from the lungs, and required to be constantly replaced, whilst the large amount of sulphuric ether, when once absorbed, took a much longer time to evaporate in the breath. It was necessary for the patient to breathe air containing not less than fifteen per cent. of vapour of amylene, in order to reach the third degree of narcotism, or that condition in which consciousness and voluntary motion are entirely suspended, the pupils being usually contracted and turned upwards, but the muscular system not necessarily relaxed. The patient must inhale the amylene at the rate of rather more than a fluidrachm a minute; in this way he becomes insensible in three minutes, or rather less; but if the vapour was not inhaled in a sufficient volume, he would not become insensible by continuing the inhalation, for however long a time; the quantity of vapour must be increased, or it would not succeed. He had administered the amylene in his ordinary chloroform inhaler, which he had, however, got somewhat enlarged. In the use of amylene, absence of pain had been obtained with less profound coma than usually accompanied the employment of chloroform and ether. There were some cases, indeed, in which the minor parts of an operation, under these latter agents, might be performed without pain, whilst the patient was in a semi-conscious state, or even altogether

conscious; but they formed the exception; whilst in the use of amylene, the patient had very often been partially conscious during the operation. In a case that day, in which Mr. Fergusson removed a large melanotic tumour from the groin, the man repeated some verses very accurately whilst the arteries were tied, and was awake and talking to the bystanders whilst the wound was being stitched up, but felt nothing of it. The pulse was increased in frequency and force, during the inhalation of amylene, to a greater extent than happened with chloroform; the respiration also was very often accelerated, about as often as in the inhalation of ether, and more frequently than with chloroform. There had not been much increase of saliva from the use of amylene, and he (Dr. Snow) had not yet met with the profuse flow of saliva which was often troublesome in the employment of chloroform and ether. There had been no sickness in any of the twenty-one operations in which he had exhibited the amylene, nor any of the depression which so often preceded and accompanied the sickness from chloroform and ether; and there had been hardly any struggling or rigidity in any of the patients, although several of them being robust men, a good deal of both might have been expected before complete insensibility, if chloroform had been the agent employed. He was of opinion that amylene would be perfectly safe with careful management. Sulphuric ether seemed to be perfectly safe in whatever way it was used; although it had been blamed for causing death, no fatal accident seemed to have been really occasioned by it. This arose from the circumstance that the dose of ether occupied so much space in the form of vapour, that it could not enter the system except by degrees, and its effects were necessarily produced gradually. In regard to chloroform, however, even a fatal dose occupied but a very small space in the form of vapour, and unless great care was taken to have it largely diluted with air, it might act with dangerous rapidity, and the point of safety might easily be overstepped. The quantity of amylene which required to be inhaled, occupied, in the form of vapour, a volume intermediate between that of the vapour of chloroform and that of ether, and in all the ordinary methods of inhalation it must become mixed with a large portion of air. The relative advantages of amylene might be summed up as follows: In regard to its odour, it was more objectionable than chloroform, but much less so than sulphuric ether. In the amount which sufficed to induce insensibility, it was also intermediate between these two agents. In regard to its pungency, it had a great advantage over both ether and chloroform, being much less pungent than either of them; on this account the patient could always begin to inhale the amylene of full strength within half a minute, and the operation might generally be commenced within three minutes. It had an advantage in preventing pain, with a less deep stupor than was occasioned by the other agents, and in the ready waking and recovery of the patient, it had an advantage over chloroform, and a still greater advantage over ether. The almost entire absence of struggling and rigidity in the use of amylene is another advantage it possesses; and the greatest advantage of all, if it should continue to be met with, is the absence of sickness from its use.

Dr. Richardson had seen three cases in which amylene had been administered by Dr. Snow. He thought the stages of narcotism were not so well marked in these cases as in those in which chloroform was administered. In the first case, the man became insensible to pain in three minutes and a half; in the second case, a child, in two minutes; and in the third case, a man, in one minute fifty seconds. The man's pulse was 134, and the respirations 60, in the minute. The most remarkable feature in these cases was, the perfect quietude of the patient. Amylene, in its effects, was most allied to the common coal-gas. Mr. Nunneley had tried this agent, and would have persevered in its use had it not been so offensive in its odour, etc. Dr. Snow's patients had recovered from the effects of the amylene very rapidly. Neither of them appeared to be quite unconscious, though perfectly insensible to pain. He (Dr. Richardson) considered the simplicity of the compound—a hydro-carbonate—in favour of its employment. It had struck him that the extreme cold produced by the evaporation of amylene would render it a most useful means of producing local anæsthesia.—*Lancet*, Jan. 17, 1857.

At a subsequent meeting of the Society, Dr. Snow showed a specimen of amylene which had a less powerful and more agreeable odour than that which he showed to the Society on a former occasion. He said that the change had been produced by great care in its preparation on the part of Mr. Bullock, and that the chief obstacle to the use of this agent was in a great measure removed; and he expected that the odour would be still less, when the amylene could be procured in a state of more absolute purity. He had given the amylene in 69 operations, and in one case of labour since he read the paper on Jan. 10th, making a total of 91 cases. The results confirmed what he had stated on the former occasion, as to certain advantages it possessed over chloroform in a number of instances. A little vomiting had occurred in six of the cases; this was much less than would be met with from chloroform, more especially as many of the patients had taken a meal just before the operation.—*Ibid.*, March 7, 1857.

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7. *Cyanosis of the Blood by Chloroform.*—M. CHASSAIGNAC, surgeon to the Hôpital Lariboisiere, states that he has often remarked, "in performing operations, and principally amputations of the leg and thigh, upon patients under the influence of chloroform, that the blood jet coming from the arteries presented, in place of its bright scarlet colour, a deep dusky tinge, almost like to that of venous blood. This colour proved evidently that the blood had not undergone in the lungs a sufficient revivification or oxygenation, and that there was from that time a commencement of asphyxia. But this does not only exist in cases where the method of administration of chloroform is defective, but it is positively established in those cases where all precautions had been taken to avoid asphyxia. It has been necessary, then, for us to conclude, from the above, that, even with an inhalation very well performed, the blood of patients submitted to the action of chloroform does not undergo, to the normal extent, the changes in consequence of which the blood becomes arterial from venous.

"In looking at this more closely, we have seen that this effect, called by us, improperly, perhaps, 'cyanosis of the blood,' was observed, at its highest degree during the period of collapse, to diminish afterwards in proportion as the respiration resumed its normal type. If, from motives that we have previously deduced, we might not have already considered the state of collapse as a serious condition during anæsthesia, this circumstanee of the cyanosis of the blood attaining its maximum during the period of collapse would have been sufficient to fix our opinion on this subject. But that is not the point upon which we insist at this moment. That which we wish to prove is, that the inhalation of chloroform, at the time even when we practise it in a manner the most discreet and well managed, is accompanied always with a certain degree of incomplete asphyxia, attested by a change in the colour of the arterial blood, the alteration being much more pronounced during the collapse.

"There is an experiment that we have never made, but it would not be difficult to try it in certain operations. The experiment would consist in receiving, in graduated tubes, sufficient quantities of blood thrown out by the arteries, and collected at different periods of the anæsthesia. Unless we are much deceived we should find remarkable differences in the colour of the blood in different tubes.

"Hitherto this question has been too little studied for us to treat it more at length. We propose to ourselves to examine it more completely, but, provisionally, it has seemed to us that this circumstance of the cyanosis of the blood, even in slightly established degrees of anæsthesia, deserved to be pointed out to medical practitioners; and still more so the sensible increase of this cyanosis during collapse."—*Lancet*, Feb. 21, 1857.

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8. *Medicinal Properties of Iodoform.*—This body, discovered by Sénellas, presents itself in the solid form in the shape of glittering spangles, of a sulphur-yellow colour, friable, soft to the touch, of an aromatic persistent smell; it contains more than nine-tenths of its weight of iodine; its taste is sweet, and it has no corrosive property. Administered to dogs, it kills in a weaker dose than iodine, after having given rise to more or less marked depression, and rarely